

[DIGITAL TO ANALOG CONVERTER USING TUNNELING CURRENT ELEMENT]

Abstract

A method and structure for a digital-to-analog converter comprising a voltage source supply; a voltage division stack connected to the voltage source supply; a multiplexer connected to the voltage division stack; a digital circuit connected to the multiplexer; an analog circuit connected to the multiplexer; and an input binary word source connected to the digital circuit, wherein outputs of the digital circuit are input into the analog circuit and converted as analog output. According to the invention, the multiplexer comprises any of an NFET and/or a PFET. The digital-to-analog converter further comprises a capacitor connected to the analog circuit and a binary-weighted tunneling current device connected to the digital circuit. The multiplexer and the capacitor are made of thick oxide (at least 5 nm thick). The tunneling current device outputs tunneling current, wherein the tunneling current is adjusted in proportion to a binary weight of the input binary word source.